AN has passed through the stone age, the bronze age and the iron age and is now entering an amazing age which may be recorded in future history as the "nitrogen age." The from the time of Adam and Eve down to the beginning of the Harding ad-

bate in Congress and all state legislatures as the tariff, equal suffrage and prohibition have been in past years: teachers and college professors will make more fuss over it than they now do over the dead languages; farmers will overlook the weather.

SCIENTISTS have made the startling

CTARTLING Fact That Food Supply of Future Depends Upon Nitrogen-Scientists Have Discovered That the Air We Breathe Contains an Inexhaustible Reservoir of the Material Needed to Rehabilitate Worn-out Farms and Keep Present Good Farms in State of Fertility-Nitrogen Will Increase the Acreage Production Everywhere Over Its Present Capacity-From the Stone, Bronze and Iron Ages to the Nitrogen Age.

rines will print columns about it; amounts in 1904. According to census authorities, the number of tons of messages to Congress; country school States during certain years were as teachers and college professors will . 8,432,000 tons Although the south has been and is

to discuss it; men and women of the cities will soon find it to be a fascinating topic of conversation because it affects their future eating and clothing.

Why? Simply because the future supply of daily food for the men. women and children of America practically depends upon the use of nitrogen as a fertilizer by the farmers of the United States.

* * * * * of the south.

This very rapid growth in the use of fertilizers in the United States is



powder, explosives and chemicals are the heart of munitions, and it can be truthfully stated that fixed nitro-gen is the heart of powder, explo-"The slight affinity existing be-tween nitrogen and the other ele-ments gives a peculiar character to

its compounds and many of them are extremely prone to decomposition with the almost instantaneous development of heat and gas. It is the application of this principle that has created the large explosives field

that today exists.
"Black powder is dependent for its explosive quality upon a nitrogen compound—or potassium nitrate. Smokeless nitrocellulose powder is formed by the combination of a nitrogen compound with cellulose or purified cotton through the action of nitric and sulphuric acids. "TNT, or trinitrotoluol, is similarly

formed by the combination of a ni trogen compound with toluol; picric acid, explosive D. tetryl, ammonium dependent upon fixed nitrogen.
"The first nitrogen compound used in warfare seems to have been potas-

it was known in Europe about the eighth century. It took some 400 years, however, to learn how to comit with sulphur and charcoal form black powder.

"For 600 years or from 1250 to 1875 lack powder continued as practically the sole representative of chemistry ward its more efficient utilization. For many years it was used solely as a propellant, and then sufficient knowledge was developed to utilize it in addition as an explosive-bursting has always been to learn how to use more and more of it.

"From 1875 to the present date, the development of powder and explo-



MAIN BUILDING OF NITROGEN RESEARCH LABORATORY LOANED BY AMERICAN UNIVERSITY.

of the entire outfit.
It costs about \$300.000 annually to mate value of the discoveries of this notable group of scientists can only be estimated in terms of billions. Their job is to learn how to harness nitrogen and make it work for us in the years to come, just as the Frank-lins. Edisons and others learned how to harness electricity.

IT must not be assumed, however, that American scientists are the only ones who are endeavoring to make this the great "nitrogen age." Practically all European countries. particularly Germany, are spending many millions in an effort to further improve and cheapen the present known methods of securing fertilizer

long since learned that the chief cause of the decadence of nations is the wearing out of the agricultural lands. The late Theodore Roosevelt clearly grasped this vital danger to America when he said: "I have always been deeply impressed with Liebig's statement that it was the decrease of soil fertility, and not either peace or war, which was fundamental in bringing about the decadence of nations While unquestionably nations have been destroyed by other causes, I have become convinced that it was the destruction of the soil itself which was, perhaps, the most fatal of all

COMMERCIAL fertilizers first began to be used in this country some fifty years ago and their use has increased steadily. By 1904 the value of the fertilizers sold was ten times their value in 1869. From 1904 to 1914 the growth was very much more rapid, the value of the products in 1914 being three times, and the total tonnage of fertilizers manufactured being ap-proximately two and a half times the

"The first chemical used in war-

to-date use of chemical ordnance. "The first chemical used in war-fare seems to have been gunpow-der—or a combination of potassium maitrate, sulphur and charcoal. This

which allowed of the nitrification, through the use of nitric gold, of Various bases; namely, cetton, glycerin, mercury, carbolic acid, toluol, etc. This was a step of tremendous importance in explosives chemistry. The ability to use these nitrated materials in warfare has grown raighly. In 1886, only thirty-four years agosmokeless powder was invented and made applicable to the use of firearms, and it is since that time that TNT, ammonium nitrate and other high explosives have been perfected and been combined with our muniions programs.

GTT is interesting to trace the quan-I titles and sources of fixed nitrogen available during this development. Practically the only natural deposist of potessium nitrate in existnce occur in British India and from During the various wars that bave occurred from the invention of clack powder to the present day there has apparently always been a shortage or nitrogen on one side or the other, and all sorts of schanes have been tried in an effort to overcome this shortage. It so happens that animal induid contains considerable nitrogen in the form of ammonia. Wood asnes are contain potassium. In the presence of limestone these two materials principle, initrate farms have for saveral hundred years been relied upon, especially in time of war, to fix the ammonia in animal fluids in a satisfactory form for munitions purposes. "With the development of the nitrigent for suitable fixed nitrogen compounds for war purposes has very materially increased "The demand for fixed nitrogen for peace pursuits can be divided into two main classes—jertilizers and the chemical industry. have occurred from the invention que black powder to the present day there

mestic explosives—how they are being used in constantly increasing amounts to mine, metal ores, coal, rocketc., to displace human labor in the exceptation of ditches and foundations, the planting and cutting of trees, etc., and we know haw important it is that this use he not only maintained, but increased in time of war.

"As a general statement of the rate of growth of the use of inorganic nitrogen can then be manipulated chemically, so as to produce the desired material."

To meet the demand already outlined we have been dependent upon domestic inargenic nitrogen in the form of amounts of the cause of the nitrogen research laboratory out on Massachusetts given a constant of the search laboratory out on Massachusetts given a constant of the search laboratory out on Massachusetts given a constant of the other hand, causes tremendous difficulty relatively in harnessing it. The artificial fixation of atmospheric nitrogen by chemical fixation of atmospheric nitrogen by chemical fixation of atmospheric nitrogen by chemical fixation of atmospheric nitrogen by chemical of atmospheric nitrogen by ch

the nitrification, nitric gold, of va-nitric gold, contained upon imported inorganic nitrogen to form of nitrate of soda from Came of tremendous im-ty-product coke oven ammonium sul-phate from Europe, and of imported synthetic nitrates.

ynthetic nitrates.

"At present this is the only source of inorganic nitrogen in the United States. By-product coke ovens are most important to the future of America.

"Today the United States is getting less than half its peace-time inorganic. less than half its peace-time inorganic nitrogen requirements from coke ovens, and as every reasonable indication is to the effect that the demand for such nitrogen will grow faster than its production from by-product overs, i. obvious that other sources must be ways available to keep supply and de-

mand in step.
"Nitrogen is produced in gas works from coal in a manner similar to the by-product oven. The quantity is relatively

product oven. The quants of northern small.

"The rainless deserts of northern Chile contain a vast supply of raw material called 'caliche,' from which the commercial salt known as nitrate of soda or Chile saltpeter is refined. Various estimates exist as to the extent and consequent life of these deposits. Production during the last five years has been at the rate of between 2,500,000 and 2,000,000 tons annually. At this production

stay combined with other elements, which gives it so much value in explosives, on the other hand, causes

we have been dependent upon domestic increase the size of the hitrogen research laboratory out on Massachusers avenue, until it becomes the monia and ammonium sulphate from byproduct coke evens and gas works; domestic organic nitrogen in the form of in the entire world.

AROUND THE CITY

sppearance goes, anyhow. Take any young soldier when he first came home from France, a victory medal of living bronze and in his eyes an inscrutable something that seemed to be forever and travel until you come to mountains with their peaks in the clouds."

"I'll love to climb the high mountains, dady." something that seemed to be forever tains, dady." visioning, say, Flanders field where poppies grow-and look at him now!

clothes are as fine as a tailor can deserts make and his job carries a fat check for every week in the year. Also, he my way. But I won't get lost, has the best wife ever and a lot of daddy." dandy children-he will tell you so himself.

himself.

"All pleasant and prosperous enough and I realize my good fortune, but—
well, it's this way, Miss Ann: Peace is better than war, but it isn't half as interesting. You ask any chap who came home with a whole body and he will tell you that if war was to happen temorrow at 11 e'clock he would be in it before noon."

That was about all you could expect of a confidence limited to two floors—counting by an elevator going up—and when the ex-officer got out another man, old and gentle of voice, said to the woman:

"He will get over his restlessness when gray hairs come. Universal peace is bound to rule for the reason that it is only youth that wants to

"Excent and tigers. But I won't let them get me, I'll fool them, all right."

"And then you keep traveling and the world and come home through the world and come home

up—and when the ex-officer got out another man, old and gentle of voice, said to the woman:

"He will get over his restlessness when gray hairs come. Universal peace is bound to rule for the reason that it is only youth that wants to fight"

fight."

"But there is always youth," suggested the woman.

The eld and gentle one only shook his head with smiling induigence—women are such fooligh things—and the woman let it go at that. All the same, as she stepped out of that elevator she said to her own dear self, without fear of contradiction:

"Youth is youth—therefore: Man will never understand the meaning of peace until he attains the peace that passeth understanding." It is always satisfactory to have of his body. The other kept his hat the last word.

SHE was as daintily sweet in her wedding finery as that other sir!" bride that the witch turned into an apple blossom. And when everything
The reminder sent the friend's
memory harking back to a day she
came across the man and his littlebit daughter on a bench in a park.
He had told her about the appleblossom girl, and then came a play
lesson to teach her that the world was ever and the father had waved to her last signal as she entered the Pullman, he said to a friend, who was standing next at the gate. "Her greetest adventure of all-

of PEACE is better than war, but it isn't half as interesting."

You have agreed with the and placed a pebble in the middle man who said it, as far as with the lesson about like this:

One will do for illustration: His them. daddy." "And across wastless tracks of "Where I'll die of thirst if I lose

"And go through jungles"
"Full of lions and tigers. But I won't let them get me, I'll fool them.

BAND was passing. Two men who obviously wanted to be taken That's the sun," flashed Kate. "Moon!" hewled Petruchio.

A SHABBY old couple stood on the Avenue side of a magnolia tree in the White House grounds. Some of the creamy leaves had drifted through the railings to the pavement, and the man, with the slow clumsiness that

THE RETURN.

By Edmund Haraucourt.

Translated From the French by WILLIAM L. MCPHERSON.

T is an island of the ancient country of Armorica, a little is and a league long and hardly half as wide, a scrap of land lost on the confines of the ocean.

dering, confused and infinite, unlocalized and infinite, unlocalized and indistinct, rose up to her, like the noise of mobs on the march or of trains which cross a plain at night, on the distant horizon.

Finally there came the gentle swash of a moving boat, the flapping of sails and the dull thud of oars tessed on the landing place.

of the ocean. Because it bristles with steep rocks and because the spray has burned out the soil men have never been able to enrich it by cultivation. It has remained through all time what it was at its birth, unalterably virgin.

It is an impeccable purity of tones, in which nothing clashes. Each morning the breezes, like conscientious servants, sweep the land, dust the rocks, poilsh the sky and pass the light through a sieve. Every blade of grass is maternally washed and then dried. No dead leaf lies on the ground, no must stains the carpet-like surface. All is clean, very poor, very noble, like the cottage of a princess who would be a fairy. The rocks, of fiesh-colored grantite, are lined with mosses, whose green is so tender against a soft rose that, seeing them, one thinks of an infant sleeping on precious tissues. Their shadows are violet and their half-tints lilac. The carmine of the heather and the mauve of the thyme mix discreetly with the paleness of the camomiles. The grass doesn't dare to be green. It is blond. It gilds itself. It is ceasenessiy in motion. The stan's rays, coming through the salty prisms of an atmosphere which is always vibrant, refract and break so that their incidence is never direct, but the light suffuses and envelops all things. It caresses, penetrates and bathes the shadows.

** * * * n which nothing clashes. Each morn-

druidess lived here. One can temper.

THUS the old widow speke to console the young one. And the candle burned and the flame quivered. making the shadows dance over the two boxlike beds, which resembled coffins fastened to the wall.

Finally Celine finished her work, undressed and went to sleep. She got up very early the next merning. The sun was hardly above the horizon when she saw the assistant at The sun was hardly and the semaphore station coming toward her. He brought a dispatch, and she wasn't astonished, since she had been waiting for it for eight months. Her husband had landed at Brest and would reach home that night.

The day passed, a little tediously. The night came.

She who was no longer a widow was seated on the recks, near the jetty. She was waiting. The hour of return was at hand.

The tide was falling. It was almost at the ebb. The gray night was thick with almost imperceptible stars, which flared and trembled as if the wind was going to put them

if the wind was going to put them

out.

The formless promontories entered the leaden sea and lost themselves in shadow. Between their arms the still water formed a circle which seemed illumined only by its own light. At the end of the jetty a planet shone from a little light tower. The weak harbor waves died among short drift and backed away rumbling. Hearing them, on all sides, one would say that myriads of beasts were struggling down there amid the ooze and "Then you voyage over oceans—"
the seaweed, while, enveloping these
"Full of whales—but I won't mind innumerable sounds, the harsh voice of the ocean, from afar, roared about the outlying rocks. A clamor, wan-

showed for cricks, stooped to pick one up and pass it to the woman. She admired it with a smile that carried a sigh:
"Maybe it's on account of the dusk, but it doesn't seem so velvet-like as ours."

would make a woman cry.

"Except one," said the friend. But she said it to herself. Death is not a welcome guest at a wedding feast.

"Moon, you bat-eyed hootch hound! a wolcome guest at a wedding feast.

"Moon, you bat-eyed hootch hound! ain't the meon, back, back home we A windy dusk-Monday's gale-

A paused to take in the music and line of marching youngsters, and one of them lifted his hat and held it on.

A paused to take in the music and along to wherever she might be golden that no child should knew.

"Now, you run right home, or I'll tell the March lion that eats up bad

A paused to take in the music and line of marching youngsters, and one of them lifted his hat and held it on.

"Say, man, where's your patriotism? aloft, with a military straightening of his body. The other kept his hat Why the first note of the national anthem makes me feel like following wherever a flag leads the way—yes. sir!"

The other man doubtless had the deepest sort of respect for his companion's loyalty, but, all the same, he grinned. Possibly for the reason that the band was playing "Auld Lang Syne."

Who obviously wanted to be taken along to wherever she might be go had one of the music and along to wherever she might be go had put in his baby eyes a terror that no child should knew.

"Now, you run right home, or I'll tell the March lion that eats up bad ing. She had found coaxing a failure and was handing him a threat that children to come and get you, and the child, standing stock still and the child, standing stock still and the woman who must have known all about children, being an old maid:

"Come along, sonny, let's go home."

He lived should knew.

"Now, you run right home, or I'll tell the March lion that eats up bad ing. She had found coaxing a failure and was handing him a threat that children to come and get you, and the child, standing stock still and the child. She breezed around the corner, and the child, standing stock still and the child. She breezed around the corner, and the child. She breezed around the corner, and the child, standing stock still and the child. She because the woman who must have known all about children, being an old maid:

"Come along, sonny, let's go home."

He lived shout a half-block away.

He lived shout a half-block away.

The other man doubtless had the deepest sort of respect for his companion's loyalty, but, all the same, he grinned. Possibly for the reason that the band was playing "Auld Lang Syne."

Lucetto sent were to him. The servant returned saying she was busy. Hortensio saying she was busy. Hortensio saying she was busy. Hortensio saying she was The other man doubtless had the deepest sort of respect for his companion's loyalty, but, all the same, he grinned. Possibly for the reason that the band was playing "Auld Lang Syne."

"Ladv says tell you there isn't need Mosh lion. Its just the win' blowin'."

And that's the end of that, except

and the dull thud of oars tessed on the landing place.

The wife arose and made her way down toward the jetty. The husband heard the sound of her sabots on the rocks. He listened. He was sure He cried, "Marie Celine!" She cried back. "Jean Marie!" Then they lapsed into silence with their stoic modesty, not wishing to their stoic modesty, not wishing to show before others their emotion or

their love. In the soft night only the tread of the sabots on the rocks an-

hands skilled in hair pulling, an en-ONE can understand that the viable uppercut and a redheaded

"Sire. as a musician your daughter Kale's a good soldier." he reported ruefully. "Iron might hold her never lutes. I tried to break her to the lute and she broke the lute to me."

and she broke the lute to me."
here she is. Greetings, gentle one!
I hear thy name's Kate."
"Brink some ear oil. Freshie! My
Petruchio grinned grimly.
"I scarce can wait to chat this lusty
wench. Trot her forth, fond father,
and clear the decks for the fray. Ah,
name's Kathsrins."
"You lie! Your name's plain Kate.
I'm moved to make thee for my wife."
"Let that that moved thes henceremove thee hither." and Kate walloped him on the occipital bone...
"I'll cuff you if you do that again."
shouted Petruchio, and Baptista came
back inquiring what progress he had
made.
"Pather would wed me

made.

"Pather would wed me to a ruffian
—a half-mad lunatic." cried Kate,
but her plans were all made for her.
The week passed, with the music
"How else with maid so gentle and
calm?" asked Petruchio. "We've selected next Sunday for the wedding master and the professor quarreling

SUNDAY dawned, and no Petruchio. Even Kate wept, as the day wore on, because she was jilted. Then a servant rushed in to tell them that Petruchio was coming attired in

pants thrice turned, a new hat, an old jerkin, old boots, riding a horse gnawn with the bats, swayed to the back, shoulder-shotten and behinded stark spoiled with the staggers, bewith a moldy saddle. And when the priest asked Petruchio if he'd have fiercely that the poor sky pilot drop ped his book. The ceremony over. Petruchi-Kate for worse and more of it. he

swore, "Ay, by gogs wounds," so placed Kate on a horse that matched his own, and they set out for Verona. Petruchio's home. Kate fell in a bog. and Petruchio let her lie there while he beat the servant for letting her horse fall. Home at last. Kate begged for food,

but Petruchio found fault with everytrea ment for chronic sorehead Bian-ca, back in Padua, had run away and married Lucentio. Hortensio had healed his heart by hooking a rich widow. At last Petruchio decided Kate was tame enough to go to visit

"All right, moon," sighed Kate

came.
you do is treat 'em rough. You remember them noble lines of Dante: